

Amendments to the Drawings:

In the DRAWINGS Section, please replace Fig. 5, Fig. 6, Fig. 9, Fig. 10a and Fig. 10b with the attached Replacement Sheets.

To better indicate that the translinear amplifier is imbedded within the circuit to control the switching operation, a frame marked **Switch-Ctrl** in the drawings (Figs. 5, 6, 10a and 10b) now indicates the circuit comprizing said translinear amplifier and possibly some glue components around it.

Further in Fig. 10a the additional circuits for the signal cut-off functions **CutOffC-Hi** and **CutOffC-Lo** are now marked with additional frames.

Similar in Fig. 10b the temperature compensating circuit **Temp-Comp** is additionally marked.

The common connection to all output reference points of the translinear amplifiers (as of **Fig. 6**) is now indicated in **Fig. 9** as the common output reference level **C-Ref-out**.

Attachment: Replacement Sheets for Fig. 5, Fig. 6, Fig. 9, Fig. 10a and Fig. 10b.

REMARKS/ARGUMENTS

In response to the subject Office Action, an Amendment to the Specifications and to the Claims section is herein submitted.

Examiner Nguyen is thanked for thoroughly reviewing the above referenced patent application, and for the indication of allowability once various formal matters and informalities are corrected.

Remarks and Arguments on Claim Rejections due to 35 USC §112

1. Reconsideration of the rejection of claims 1-52 as being indefinite is requested, based on the following.

2. Regarding claim 1, the recitation "**a circuit** to individually provide the threshold levels for each of said capacitor switching stages, building a measure for the input and the output reference levels for each of said translinear amplifiers within said capacitor switching stages; **a circuit** to provide the output reference level for said translinear amplifiers (is claim 10); and a circuit to provide a signal, dependent on the tuning voltage, dedicated for the voltage controlled capacitance change, to the

inputs of all of said capacitor switching stages" is indefinite, because it is confusing for several reasons:

The structure of the claims 1, 17, 26, 33, 43, and 74, are now further amended. It is now made clear, that the circuit to control the switching operation (also called hereafter the switch control circuit) comprises a translinear amplifier as its key component. Drawings Fig. 5, Fig. 6, , Fig. 10a and , Fig. 10b show an additional frame, clearly marking said switch control circuit **Switch-Ctrl** and its embedded translinear amplifier. The additional circuits to drive said switching device to a fully on or off state (claim 17) and a circuit to compensate the temperature deviation of said switching device (claim 26) are explicitly shown in Fig. 10a and Fig. 10b. Further the nomenclature of Threshold levels and reference levels is tightened. Also distinguishing clearly between input reference levels and output reference levels in the specifications and in the claims should significantly improve clarity of definitions. Appropriate changes are made to the specification . Consequently claims 33, 43 and 47 are restructured in the same way.

A major change in the specifications reads as follows:

A single capacitor switching stage, as shown in Fig. 5, contains a circuit to control the switching operation **Switch-Ctrl** (also called hereafter the switch control circuit), a switching device **SW** and a small capacitor **Cap**. Said circuit to control the switching operation receives a signal, dependent on the tuning voltage **Vtune**, an input reference signal **Ref-in-5** and an output reference signal **Ref-out-5**. The translinear amplifier in Fig. 5, imbedded within said circuit to control the switching operation **Switch-Ctrl**, possibly together with some glue components, compares the differential voltage at its inputs **Vinp-5** and **Vinn-5** and, through various current mirroring techniques, provides the same differential voltage at its outputs **Voutp-5** and **Voutn-5**; i.e. the output difference of said amplifier strictly follows the difference at said amplifier inputs, independent of the absolute voltage level at the outputs. Said switch control circuit **Switch-Ctrl** then provides a switch control signal **Vsw**, based on said The translinear amplifier's output signal to said switching device **SW**. Switch control signal **Vsw** then drives said a current switching device **N1-5** with the gate voltage **Vg-5** to switch on said individual small capacitor **Cap-5** in the proposed steady ramp-up/ramp-down manner. The result is the variable capacitance **Var-Cap-5** of said single capacitor switching stage.

Claim 1 is now amended to:

Claim 1.: A circuit to control the capacitance of a variable capacitor in a strictly linear mode a steady tuning voltage and to achieve a high Q-factor at the same time; comprising:

- a set of individual small capacitors;
- a set of capacitor switching stages, each stage comprising:
 - a switching device, allowing a steady ramp-up/ramp-down phase between the points of being fully switched on and fully switched off, and where said switching device is connected in series with one of said capacitors, to connect a multiple of said capacitors in parallel;
 - a circuit to control the switching operation of said switching device in a steady ramp-up/ramp-down manner between the points of being fully switched on and fully switched off, comprising:
 - a translinear amplifiers to produce the ramp-up/ramp-down signal for each of said set of switching devices, where said translinear amplifier is implemented within said circuit to control the switching operation;
- a circuit to individually provide ~~the~~ a multiple of threshold reference level pairs, one pair for each of said capacitor switching stages, each pair building a measure for the ~~an~~ input reference level and the ~~an~~ output reference levels for each of said translinear amplifiers within said capacitor switching stages;
- ~~a circuit to provide the output reference level for said translinear amplifiers; and~~
- ~~an circuit to provide a input~~ an ~~signal, dependent on the tuning voltage, dedicated for the voltage controlled capacitance change, connected to the inputs of all of said capacitor switching stages.~~

3. Regarding claim 1 being unclear "if the signal (Vref) in figure 9 of the present application is the input signal or the output signal". and the recitation "the output reference levels" lacking antecedent basis, is now corrected. Drawing Fig. 9 is amended to show a single signal C-Ref-out as the common reference signal, being connected in common to all output reference points of the translinear amplifiers. The specifications are amended accordingly.

4. Regarding claim 17, the recitation "a circuit to drive said switching device to a fully on status" on line 22 and "a circuit to drive said switching device to a fully off status" on line 27 are indefinite because it is not clear as to these two "circuit" is the same or different than the "a translinear amplifiers" on line 18.. Drawing Fig. 10a and the specifications are amended to show these three circuits as three separate circuit, operating inparallel according to their specific function and their outputs being connected (dot or connection) to a single line, where the cut-off circuits override the translinear amplifier's control operation when said steady ramp-up/ramp-down area is exceeded (see Fig. 7). Specifically, the specification is amended as follows:

A possible solution for said signal cutoff functions could be to implement said signal cutoff functions as separate circuits in combination with, but external to said translinear amplifier. As long as the capacitor switching device operates inside its **steady ramp-up/ramp-down area** in Fig. 7, the translinear amplifier controls the linear operation. However, when said steady ramp-up/ramp-down area is exceeded, one of the two additional signal cut-off circuits overrides the translinear amplifier's output, thus taking over the control of the capacitor switching device. The point where the cut-off circuits take over control are said cutoff edges **CutOff Lo** and **CutOff Hi** as presented in Fig. 7.

The principal concept of said separate circuits for said signal cutoff functions is shown in Fig. 10a, which shows the two signal cut-off circuits **CutOffC-Lo** and **CutOffC-Hi**, in addition to (main) said circuit to control the switching operation **Switch-Ctrl**, as shown in Fig. 5. The outputs of all three control circuits operate together (functionally similar to a dotted-OR connection) to drive said switching device; thus each cut-off circuit can override the output of the **Switch-Ctrl** circuit once the switching device leaves the desired steady transition area -Switching devices **N3-10** and **N4-10** Signal-cut-off circuit **CutOffC-Lo** and signal-cut-off circuit **CutOffC-Hi** symbolize two circuits to drive said switching device to a fully on (i.e. low impedance) or fully off (i.e. high impedance) state, when said capacitor switching device operates outside said steady ramp-up/ramp-down area on the said switching device's low resistance side or high resistance side. Appropriate threshold elements detect the limits **CutOff Lo** and **CutOff Hi** of the steady ramp-up/ramp-down area, as shown in Fig. 7 and as explained above. Said threshold elements then provide the two control signals **CtlCutOff Lo** and **CtlCutOff Hi** to either force said fully on or fully off state are **CtlCutOff Lo** and **CtlCutOff Hi**, which control two switching devices **N3-10** and **N4-10** in Fig. 10a. Consequently, the same amendments and their remarks apply to claims 44 and 45.

5. Regarding claims 20 and 21, the Word Program error, causing wrong numbering "claim 1817" and "claim 1917" is now corrected.

Reconsideration of the above rejection (or objection) is therefore respectfully requested.

All claims are now believed to be in condition for allowance, and allowance is so requested.

It is requested that should there be any problems with this Amendment, please call the undersigned Attorney at (845) 452-5863.

Respectfully submitted,

A handwritten signature in black ink, appearing to be 'SBA', written in a cursive style.

Stephen B. Ackerman, Reg. No. 37,761